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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/054,148	01/22/2002	Michael Kagan	4350-4000	4712

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Mark M. Friedman, Dr. Mark Friedman Ltd.
c/o Discovery Dispatch
9003 Florin Way
Upper Marlboro, MD 20772

EXAMINER

JUNTIMA, NITTAYA

ART UNIT	PAPER NUMBER
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2663

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/054,148

Applicant(s)

KAGAN ET AL.

Examiner

Nittaya Juntima

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 9, 12-18, 21 and 24 is/are rejected.
- 7) ☐ Claim(s) 7, 8, 10, 11, 19, 20, 22 and 23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/22/02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Drawings

1. For clarity purposes, please make the following corrections:

In Fig. 1, items 34 and 36 should be labeled as "high-rate link," and item 38 should be labeled as "low-rate link".

In Fig. 2, items 42, 44, and 46 should be labeled as "output buffer", "packets generated by HCA 24", and "flow control attributes," respectively.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

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Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-6, 9, 12, 13-18, 21, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over an admitted prior art (Background of the Invention section of the Specification) in view of Attanasio et al ("Attanasio") (USPN 5,918,017).

Regarding claim 1, the admitted prior art teaches a method for static rate flow control (Specification, page 2, second paragraph), comprising:

Receiving a sequence of data packets for transmission over a network, including at least first and second packets (two successive packets: *a* and *b*) having a common destination address (the same DLID) on the network (IB), the first and second packets having respective first and second lengths (each of the packets *a* and *b* must have a respective length). See Specification, page 3, lines 5-16.

Transmitting the first packet to the destination address (since packet *a* was scheduled to be sent to the same DLID, therefore, packet *a* must be transmitted, Specification, page 3, lines 9-12).

Transmitting the second packet only after the timeout period has expired (packet *b* must be scheduled for transmission until a time T_s has passed, Specification, page 3, lines 9-12, therefore, packet *b* must be transmitted after T_s has expired).

However, the admitted prior art does not explicitly teach responsive to transmitting the first packet, placing an entry is placed in a flow control table and setting a timeout period for the entry responsive to the first length.

In an analogous art of connection routing and maintaining connection table, Attanasio teaches placing a connection table entry (equivalent to an entry) in a connection table (equivalent to a flow control table) and setting a stale timeout (equivalent to timeout period) for the entry. See col. 4, lines 64-col. 5, lines 13.

Because the admitted prior art teaches (i) scheduling a packet *b* after a time T_s has passed following the transmission of packet *a* (Specification, page 3, lines 9-16) and (ii) setting a timeout period in response to the first length (because packet *b* must be scheduled to be sent to the same DLID after a time T_s has passed following a transmission of packet *a* and T_s is a function of the length of packet *a*, Specification, page 3, lines 9-16, therefore, a timeout period of T_s based on the length of packet *a* must be set), and given the teaching of Attanasio on placing an entry in a table and setting the timeout for the entry, it would have been obvious to one skilled in the art at the time the invention was made to modify the teaching of the admitted prior art to include placing an entry is placed in a flow control table in response to transmitting the first packet and setting a timeout period for the entry in response to the first length as recited in the claim. The suggestion/motivation to do so would have been to use the table, i.e. a flow control table, and timeout period to systematically schedule and keep track of the packet transmission.

Regarding claim 2, the admitted prior art teaches that setting the timeout period comprises setting the period to a multiple ($IPD + 1$) of a time interval required to transmit the first packet (a time interval reads on the time it takes to transmit packet *a*), which time interval is

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determined responsive to the first length (since the time T_s that the input port must wait between packets is programmable and is equal to $(IPD + 1)$ multiplied by the time it takes to transmit packet a which depends on the length of packet a and the port speed, a multiple of a time interval must be set, Specification, page 3, lines 3-5 and 12-16).

Regarding claims 3 and 15, the admitted prior art teaches that the multiple is a number greater than one ($(IPD + 1)$ is greater than one, Specification, page 3, lines 12-16).

Regarding claims 4 and 16, the admitted prior art further teaches transmitting the packets (packets a and b) through a network port (the source port) having a port transmission rate (10 Gb/s), while the network is configured to pass the packets the destination address (DLID) at a destination reception rate (2.5 Gb/s) that is less than the port transmission rate, and wherein the multiple (the Inter Packet Delay $IPD + 1$) is determined responsive to a relation of the port transmission rate and the destination reception rate. See Specification, page 2, second paragraph – page 3, lines 1-9 and Table I).

Regarding claims 5 and 17, the admitted prior art further teaches that the multiple ($IPD + 1$) is substantially equal to a ratio of the port transmission rate to the destination reception rate (Table I shows $IPD = 3$ for 10 Gb/s to 2.5 Gb/s conversion, therefore, $(IPD + 1) = 4 = 10/2.5$).

Regarding claims 6 and 18, the admitted prior art fails to teach placing the entry corresponding to the destination address of the first packet, and removing the entry from the table upon expiration of the timeout period.

However, in an analogous art of connection routing and maintaining connection table, Attanasio teaches placing a connection table entry (equivalent to an entry) in a connection table

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(equivalent to a flow control table) and removing the entry from the table after a stale timeout (equivalent to timeout period) expires. See col. 4, lines 64-col. 5, lines 13.

Because the admitted prior art teaches (i) scheduling packet *b*, which corresponds to the same DLID and originating port as packet *a*, after a time T_s has passed following the transmission of packet *a* (Specification, page 3, lines 5-16) and (ii) setting a timeout period (Specification, page 3, lines 9-16), and given the teaching of Attanasio on placing an entry in a table and removing the entry from the table after a timeout period expires, it would have been obvious to one skilled in the art at the time the invention was made to modify the teaching of the admitted prior art to include placing the entry corresponding to the destination address of the first packet, and removing the entry from the table upon expiration of the timeout period. The suggestion/motivation to do so would have been to use the timeout period to accurately maintain the table as taught by Attanasio (col. 4, lines 61-63) and to associate the scheduling of packets *a* and *b* together since they both share the same originating port and DLID information.

Regarding claims 9 and 17, the admitted prior art fails to teach placing the entry corresponding to the destination address of the first packet among a plurality of entries in the table corresponding to different destination addresses in the network to which the packets in the sequence are directed.

However, the admitted prior art teaches (i) scheduling packet *b*, which corresponds to the same DLID and originating port as packet *a*, after a time T_s has passed following the transmission of packet *a* (Specification, page 3, lines 5-16), and (ii) a plurality of packets correspond to different DLIDs in the network (Specification, page 3, 2nd line from the bottom of the page – page 4, lines 1-6).

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In an analogous art of connection routing and maintaining connection table, Attanasio teaches placing a connection table entry (equivalent to an entry) in a connection table (equivalent to a flow control table). See col. 4, lines 64-col. 5, lines 13.

Given the teaching of the admitted prior art teaches of (i) and (ii) and the teaching of Attanasio on placing an entry in a table, it would have been obvious to one skilled in the art at the time the invention was made to modify the teaching of the admitted prior art to further include placing the entry corresponding to the destination address of the first packet among a plurality of entries in the table corresponding to different destination addresses in the network to which the packets in the sequence are directed as recited in the claim. The suggestion/motivation to do so would have been to use the table, i.e. a flow control table, to systematically schedule and keep track of packet transmissions for different destination addresses.

Regarding claims 12 and 24, the admitted prior art teaches the network comprises a switch fabric (IB fabric), and the destination address comprises a DLID (Specification, page 2, lines 9-17).

Claim 13 is a network end-node device claim corresponding to method claim 1, and therefore, is rejected under the same reason set forth in the rejection of claim 1 with the addition of a memory and link output circuitry. Although the combined teaching of the admitted prior art and Attanasio does not teach a memory for holding a flow control table and link output circuitry for transmit the first packet, placing an entry in the table, setting a timeout period, and transmitted the second packet as recited in the claim, it would have been obvious to one skilled in the art to include the memory and the link output circuitry in order to successfully perform the method steps as recited in method claim 1.

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Allowable Subject Matter

4. Claims 7-8, 10-11, 19-20, and 22-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nittaya Juntima whose telephone number is 571-272-3120. The examiner can normally be reached on Monday through Friday, 8:00 A.M. - 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nittaya Juntima
February 16, 2006



HUY D. VU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600